

CLAIMS

What is claimed is:

1. An isolated nucleic acid fragment encoding all or a substantial portion of a myo-inositol-1 (or 4)-monophosphatase comprising a member selected from the group

5 consisting of:

- (a) an isolated nucleic acid fragment encoding all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, 4, 6 and 8;
- (b) an isolated nucleic acid fragment that is substantially similar to an isolated nucleic acid fragment encoding all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, 4, 6 and 8; and
- (c) an isolated nucleic acid fragment that is complementary to (a) or (b).

10 2. The isolated nucleic acid fragment of Claim 1 wherein the nucleotide sequence of the fragment comprises all or a portion of the sequence set forth in a member selected from the group consisting of SEQ ID NO:1, 3, 5 and 7.

15 3. A chimeric gene comprising the nucleic acid fragment of Claim 1 operably linked to suitable regulatory sequences.

20 4. A transformed host cell comprising the chimeric gene of Claim 3.

5. A myo-inositol-1 (or 4)-monophosphatase polypeptide comprising all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:2, 4, 6 and 8.

25 6. An isolated nucleic acid fragment encoding all or a substantial portion of an extragenic suppressor protein comprising a member selected from the group consisting of:

- (a) an isolated nucleic acid fragment encoding all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:10, 12, 14, 16, 18 and 20;
- (b) an isolated nucleic acid fragment that is substantially similar to an isolated nucleic acid fragment encoding all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:10, 12, 14, 16, 18 and 20; and
- (c) an isolated nucleic acid fragment that is complementary to (a) or (b).

30 7. The isolated nucleic acid fragment of Claim 6 wherein the nucleotide sequence of the fragment comprises all or a portion of the sequence set forth in a member selected

35 from the group consisting of SEQ ID NO:9, 11, 13, 15, 17 and 19.

8. A chimeric gene comprising the nucleic acid fragment of Claim 6 operably linked to suitable regulatory sequences.

9. A transformed host cell comprising the chimeric gene of Claim 8.

10. A extragenic suppressor protein polypeptide comprising all or a substantial portion of the amino acid sequence set forth in a member selected from the group consisting of SEQ ID NO:10, 12, 14, 16, 18 and 20.

11. A method of altering the level of expression of a phytic acid biosynthetic 5 enzyme in a host cell comprising:

- (a) transforming a host cell with the chimeric gene of any of Claims 3 and 8; and
- (b) growing the transformed host cell produced in step (a) under conditions that are suitable for expression of the chimeric gene

10 wherein expression of the chimeric gene results in production of altered levels of a phytic acid biosynthetic enzyme in the transformed host cell.

12. A method of obtaining a nucleic acid fragment encoding all or a substantial portion of the amino acid sequence encoding a phytic acid biosynthetic enzyme comprising:

- (a) probing a cDNA or genomic library with the nucleic acid fragment of any of Claims 1 and 6 ;
- (b) identifying a DNA clone that hybridizes with the nucleic acid fragment of any of Claims 1 and 6;
- (c) isolating the DNA clone identified in step (b); and
- (d) sequencing the cDNA or genomic fragment that comprises the clone isolated in step (c)

wherein the sequenced nucleic acid fragment encodes all or a substantial portion of the amino acid sequence encoding a phytic acid biosynthetic enzyme.

13. A method of obtaining a nucleic acid fragment encoding a substantial portion of an amino acid sequence encoding a phytic acid biosynthetic enzyme comprising:

- (a) synthesizing an oligonucleotide primer corresponding to a portion of the sequence set forth in any of SEQ ID NOS:1, 3, 5, 7, 9, 11, 13, 15, 17 and 19; and
- (b) amplifying a cDNA insert present in a cloning vector using the oligonucleotide primer of step (a) and a primer representing sequences of the cloning vector

30 wherein the amplified nucleic acid fragment encodes a substantial portion of an amino acid sequence encoding a phytic acid biosynthetic enzyme.

14. The product of the method of Claim 12.

15. The product of the method of Claim 13.